REMARKS

Claims 1-27 were under examination and were subject to a final rejection. The applicants are filing this response along with a request for continued examination (RCE) under 37 CFR §1.114. This response amends claims 1, 2, and 24-27. Accordingly, claims 1-27 are pending. The applicants hereby request further consideration and re-examination in view of the amendments made above and remarks set forth below.

Interview Summary:

Applicants' attorneys Michael J. O'Connell (Reg. No. 42,950) and Derek J. Westberg (Reg. No. 40,872) interviewed Examiner Iwashko with regards to claims 1 and 2. Applicants' attorneys explained how the prior art identified as anticipating claims 1 and 2 did not in fact anticipate claims 1 and 2. Examiner Iwashko indicated that amending the claims to clarify the meaning of the terms "heuristic class," "heuristic classes," "replication cost," and "data placement" within the claims should move the application to allowance. Applicants' attorneys suggested the amendments to claim 1 provided above. Examiner Iwashko indicated that providing such amendments along with an RCE should resolve his concerns. With regards to claim 2, applicants' attorneys suggested that similar amendments to those suggested for claim 1 could also be provided. Examiner Iwashko indicated that such amendments should resolve his concerns with claim 2.

Claim Amendments:

Applicants have amended claims 1, 2, and 24-27 to clarify the meaning of the terms "heuristic class," "heuristic classes," "replication cost," and "data placement" within the claims. For example, with regards to "heuristic class" and "heuristic classes," applicants have amended claim 1 to clarify that "each of [a plurality of] heuristic classes [provides] a technique for placing data within [a] distributed storage system." With regards to "replication cost," applicants have amended claim 1 to clarify that "a replication cost" is "a replication cost for placing the data." With regards to "data placement," applicants have amended claim 2 to replace "data placement" with "placing

data within [a] distributed storage system." No new matter has been added by these amendments.

Claim Rejections under 35 U.S.C. § 102:

Claims 1-5, 11-14, and 24-27 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,374,227 to Ye. The rejection is respectfully traversed.

Claim 1:

Claim 1 was rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,374,227 to Ye in the office action dated Dec. 14, 2005. The applicants traversed the rejection in a response dated Mar. 13, 2006. The office action dated May 2, 2006, makes arguments attempting to overcome the traversal. The applicants respectfully traverse these arguments.

The office action argues that Ye teaches "selecting a heuristic class for data placement in a distributed storage system" by identifying that Ye at col. 36, lines 48-63, teaches a heuristic for allocation of a resource, which follows:

> Software for optimizing the allocation of a resource, the software being embodied in a computer-readable medium and when executed operable to: access resource allocation data comprising a demand for allocation of the resource, a plurality of bids for the resource, and a plurality of reserve bids for the resource; construct a maximization problem according to the demand, the bids, and the reserve bids, the bids being treated as binary variables and the reserve bids being treated as continuous variables, the maximization problem incorporating at least one problem-specific constraint that corresponds to a special ordered set and reflects that only a limited quantity may be awarded based on reserve bids placed in multiple bidding rounds by a particular entity...

Applicants assert that there are two fallacies with this argument. The first fallacy is that the claim phrase in question begins with the gerund form of the verb "to select." According to Merriam-Webster's Online Dictionary, the verb "to select" means to choose from a number or a group. Thus, in order for Ye to teach "selecting a heuristic class," Ye must teach choosing among multiple heuristic classes. Yet, Ye teaches only a single heuristic (i.e., "a maximization problem") representative of a single heuristic class as taught in the above cited section from Ye and as taught by Ye as a whole.

The second fallacy is that Ye teaches a heuristic that allocates a resource that is not a heuristic for "data placement in a distributed storage system." Ye at col. 2, line 62-col. 3, line 8, gives examples of allocating a resource, which follows:

> Although resources are discussed primarily as being shipping lanes that must be allocated among multiple carriers to satisfy the shipping demand of one or more suppliers or other shippers of goods, the present invention contemplates system 8 optimizing the allocation of any suitable resource. As an example, other particular resources might be parts used in a manufacturing process, and allocation of the resources might involve obtaining parts from among multiple parts suppliers to satisfy demand for these parts. As another example, other particular resources might be groceries or other goods that are sold in a commercial establishment, and allocation of the resources might involve obtaining goods from among multiple suppliers of these goods to satisfy demand for these goods.

Nowhere does Ye teach a heuristic for "data placement in a distributed storage system."

Therefore, Ye teaches using a heuristic for allocation of a resource, which is not "selecting a heuristic class for data placement in a distributed storage system."

The claim phrase "selecting a heuristic class for data placement in a distributed storage system" forms a part of the preamble of claim 1. After attempting to argue that this phrase is taught by Ye, which the applicants have traversed above, the office action dismissed applicants' arguments regarding the remaining portion of claim 1 (i.e., the claim limitations) as being moot and stated that the original claim rejection stands. Far from being moot, applicants' arguments regarding claim 1 continue to have relevance. As identified at MPEP § 2131, "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Further, as identified at MPEP § 707.07(f), "Where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it." Here, the examiner has failed to address any of the applicants' arguments regarding the elements (i.e., the claim limitations) of claim 1.

In response to the office action's assertion that the initial rejection of claim 1 stands, applicants assert that the arguments provided on pages 6-7 of the response dated Mar. 13, 2006, that traverse the rejection continue to have merit. Thus, Ye does not anticipate claim 1. Further, applicants have amended claim 1 to clarify the meaning of

the terms "heuristic classes" and "replication cost" as agreed upon in the interview summarized above. Accordingly, claim 1 is allowable and an early allowance would be greatly appreciated.

Claim 2:

Claim 2 was rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,374,227 to Ye in the Office Action dated Dec. 14, 2005. The applicants traversed the rejection in a response dated Mar. 13, 2006. The office action dated May 2, 2006, makes arguments attempting to overcome the traversal. The applicants respectfully traverse these arguments.

The office action first argues:

> With regards to claim 2, the Applicant argues that Ye "does not teach forming an integer program which models the data placement". However, Ye states the following, which does indeed teach the limitation in the claim: "A solver (18) receives an integer program and generates an LP relaxation solution to the integer program. An optimizer engine (16) coupled to the file (14) and to the solver (18) receives the data and the LP relaxation solution and generates an enhanced integer program that includes at least one cut according to the data. The cut includes a lifted cover inequality of a specified general from that the LP relaxation solution violates. A specified parameter associated with the lifted cover inequality is determined according to a first heuristic. The solver (18) generates a solution to the enhanced integer program that optimizes the allocation of the resource subject to the demand, bids and reserve bids" (Abstract, line 5-17). Therefore, Applicant's argument is moot in view of the prior art.

The applicants assert that this argument is not valid since the only references to data within the argument has nothing to do with "model[ing] data placement". Moreover, applicants have amended claim 2 to clarify that "models data placement" is "models placing data within [a] distributed storage system." A review of the above cited section from Ye reveals that Ye does not teach such a limitation.

The office action next argues:

> Further in regards to claim 2, the Applicant states that "Ye does not teach an objective of minimizing a replication cost". However, there is no explicit explanation of how the replication needs to be minimized, or what exactly comprises a replication cost. Therefore, the following rejection still applies, as it describes if there is the same data, the cuts are made: "Further suppose that bids corresponding to x[1] and x[4] are the same bid submitted in different rounds and therefore constitute a special ordered set having the problem-specific constraint x[1] + x[4].Itoreq.1. In

> this case, although the most optimal integral solution is x[1] = 1 and y[6] = 50, the LP relaxation solution will instead yield x[1] = 1, x[2] = 0.25, and x[3] = x[4] = x[5] = y[6] = 0. This solution, which includes the factional value x[2] = 0.25, is undesirable since it cannot in reality be implemented because x[2] is a binary variable that must have "0" or "1" as its value. Optimizer engine 16 generates at least two cuts in this example -- a first cut in the form of a violated cover inequality strengthened according to a special ordered set and a second cut in the form of a violated lifted cover inequality -- to prevent IP solver 18 from generating this fractional solution" (Column 17, lines 40-53). Therefore, the Applicant's argument is moot in view of the prior art.

The portion of amended claim 2 that includes "minimizing a replication cost" states:

> forming a general integer program which models placing data within the distributed storage system;
>
> forming a specific integer program which models a heuristic class that provides a technique for placing the data within the distributed storage system, the general and specific integer programs each comprising an objective of minimizing a replication cost for placing the data;

Minimizing the replication cost for placing the data is an objective of each of the general and specific integer programs. Each of these integer programs models placing data within the distributed storage system. It is well known that an integer program includes an objective that is optimized subject to constraints. Thus, it can be seen that the "how" of minimizing a replication cost is as an objective of each of the general and specific integer programs. Further, it can be seen that "what" comprises a replication cost is a replication cost for placing the data. Moreover, the office action's argument that the cited section teaches minimizing such a replication cost is not valid since the cited section teaches nothing about a replication cost for placing data.

The office action next argues:

> Further in regards to Claim 2, the Applicant states that "Ye does not teach solving an integer program which provides a specific lower bound for the replication cost." However, Ye states "the LP relaxation solution provides a lower bound to the integer program solution that all real solutions to the optimization problem must equal or, as is more likely in typical optimization scenarios, exceed." (Column 7, lines 49-53). Therefore, the Applicant's argument is moot in view of the prior art.

As discussed above, the claim term "replication cost" is a replication cost for placing data. Since the cited section teaches nothing about a replication cost nor a replication cost for placing data, the office action's argument is not valid.

The office action next agues:

> Further in regards to Claim 2, the Applicant states that "Ye does not teach solving an integer program which provides a general lower bound for the replication cost." However, Ye states, "This cutting process also improves the lower bound that the LP relaxation solution provides; that is, cuts introduced according to the cutting process allow the LP relaxation solution for root node 32 -- the theoretical lower bound on the total shipping cost -- to more closely approximate the optimal real solution" (Column 9, lines 44-49). Therefore, the Applicant's argument is moot in view of the prior art

As discussed above, the claim term "replication cost" is a replication cost for placing data. Since the cited section teaches nothing about a replication cost nor a replication cost for placing data, the office action's argument is not valid.

The office action next argues:

> Further in regards to Claim 2, the Applicant states that "Ye does not teach selecting the heuristic class if a difference between the general lower bound and the specific lower bound is within an allowable limit". However, even if the Applicant is not satisfied with the previous rejection above, a second reference to Ye is provided as follows: "Optimizer engine compares the unit prices of these bids at step 402 and selects the bid with the lowest unit price at step 404" (Column 23, lines 63-65). Therefore, the Applicant's arguments is moot in view of the prior art.

As amended above, "the general lower bound" within claim 2 refers to the general lower bound for the replication cost for placing the data, which is not found in any of the cited passages from Ye including the cited passage provided directly above. Further, as amended above, "the specific lower bound" refers to the specific lower bound for the replication cost for placing the data, which is not found in any of the cited passages from Ye including the cited passage provided directly above. Thus, the office action's argument is not valid.

In order for a reference to anticipate a claim, the reference must teach each and every limitation of the claim. Thus, in order for the applicants to successfully traverse the arguments of the office action, the applicants need only traverse one of the office action's arguments with respect to claim 2. Not only have the applicants traversed one of

the office action's arguments with respect to claim 2, the applicants have traversed all of the office action's arguments with respect to claim 2. Accordingly, claim 2 is allowable and an early allowance would be greatly appreciated.

Claims 3-5 and 11-14:

Claims 3-5 and 11-14 were rejected as anticipated by U.S. Patent No. 6,374,227 to Ye, which is respectfully traversed.

In the interest of brevity, the Office Action assertions regarding claims 3-5 and 11-14 are not being individually addressed here. Applicant also notes that many if not all of these assertions are incorrect. For example, with regards to claim 3, the Office Action refers to Ye at col. 6, line 67, to col. 7, line 2, for the proposition that Ye teaches, "wherein inputs used in the steps of forming the general and specific integer programs comprise a system configuration," which is incorrect Ye at col. 6, line 67, to col. 7, line 2, refers to a computer used to solve an integer program, not a configuration of a computer or a computer system (i.e., a system configuration) that is an input to an integer program.

Rather, Applicant asserts that claims 3-5 and 11-14 are dependent upon independent claim 2. Dependent claims include all of the limitation of the claim upon which they depend. As explained above, claim 2 is not anticipated by Ye. Thus, claims 3-5 and 11-14 are also not anticipated by Ye. Accordingly, claims 3-5 and 11-14 are allowable and an early allowance would be greatly appreciated.

Claim 24:

Claim 24 was rejected as anticipated by U.S. Patent No. 6,374,227 to Ye, which is respectfully traversed.

Claim 24 includes the claim limitations of claim 2 and modifies the step of "forming the specific integer program" of claim 2 to "forming a plurality of specific integer programs." Thus, since claim 2 is not anticipated by Ye, claim 24 is also not anticipated by Ye. Accordingly claim 24 is allowable and an early allowance would be greatly appreciated.

Claims 25-27:

Claim 25-27 were rejected as anticipated by U.S. Patent No. 6,374,227 to Ye, which is respectfully traversed.

Claims 25, 26, and 27 are claims drawn to a computer readable memory comprising computer code for implementing the methods of claims 1, 2, and 24, respectively. Claims 25, 26, and 27 recite the limitations of claims 1, 2, and 24, respectively. Accordingly, since Ye does not anticipate claims 1, 2, and 24, claims 25-27 are also not anticipated by Ye. Therefore, claim 25-27 are allowable and an early allowance would be greatly appreciated.

Claim Rejections under 35 U.S.C. § 103:

Claims 6-10 and 15-23 were rejected under 35 U.S.C. § 103(a) as being obvious. Claims 6-10 were rejected as obvious over U.S. Patent No. 6,374,227 to Ye in view of U.S. Patent Publication No. 2002/0177989 by Alvarez et al. Claims 15-17 were rejected as obvious over U.S. Patent No. 6,374,227 to Ye in view of *Adaptive file allocation in distributed computer systems* by Mahmood et al. Claims 18 and 19 were rejected as obvious over U.S. Patent No. 6,374,227 to Ye in view of *Reuseable Strategies for Testing Safety-Critical Systems* by Poonawala. Claims 20-23 were rejected as obvious over U.S. Patent No. 6,374,227 to Ye in view of U.S. Patent Publication No. 2002/0184555 by Wong et al. The rejection of claims 6-10 and 15-23 is respectfully traversed.

Claims 6-10:

Claims 6-10 were rejected as obvious over U.S. Patent No. 6,374,227 to Ye in view of U.S. Patent Publication No. 2002/0177989 by Alvarez et al., which is respectfully traversed.

In the interest of brevity, the Office Action assertions regarding claims 6-10 are not being individually addressed here. Rather, Applicant asserts that claims 6-10 are dependent upon independent claim 2. Dependent claims include all of the limitation of the claim upon which they depend. The Office Action rejection of claims 6-10 refers to Ye as teaching the limitations of claim 2, which is incorrect. As explained above, Ye does not teach many of the limitations of claim 2. Therefore, Ye does not teach many of the limitations of each of claims 6-10. Assuming for the sake of argument that there was a motivation or suggestion to combine Ye and Alvarez et al., such a combination would not teach or suggest these differences. Accordingly, claims 6-10 are allowable over Ye in view of Alvarez et al. and an allowance at an early date would be greatly appreciated.

Claims 15-17:

Claims 15-17 were rejected as obvious over U.S. Patent No. 6,374,227 to Ye in view of *Adaptive file allocation in distributed computer systems* by Mahmood et al., which is respectfully traversed.

In the interest of brevity, the Office Action assertions regarding claims 15-17 are not being individually addressed here. Rather, Applicant asserts that claims 15-17 are dependent upon independent claim 2. Dependent claims include all of the limitation of the claim upon which they depend. The Office Action rejection of claims 15-17 refers to Ye as teaching the limitations of claim 2, which is incorrect. As explained above, Ye does not teach many of the limitations of claim 2. Therefore, Ye does not teach many of the limitations of each of claims 15-17. Assuming for the sake of argument that there was a motivation or suggestion to combine Ye and Alvarez et al., such a combination would not teach or suggest these differences. Accordingly, claims 15-17 are allowable over Ye in view of Alvarez et al. and an allowance at an early date would be greatly appreciated.

Claims 18 and 19:

Claims 18 and 19 were rejected as obvious over U.S. Patent No. 6,374,227 to Ye in view of *Reuseable Strategies for Testing Safety-Critical Systems* by Poonawala, which is respectfully traversed.

In the interest of brevity, the Office Action assertions regarding claims 18 and 19 are not being individually addressed here. Rather, Applicant asserts that claims 18 and 19 are dependent upon independent claim 2. Dependent claims include all of the limitation of the claim upon which they depend. The Office Action rejection of claims 18 and 19 refers to Ye as teaching the limitations of claim 2, which is incorrect. As explained above, Ye does not teach many of the limitations of claim 2. Therefore, Ye does not teach many of the limitations of each of claims 18 and 19. Assuming for the sake of argument that there was a motivation or suggestion to combine Ye and Alvarez et al., such a combination would not teach or suggest these differences. Accordingly, claims 18 and 19 are allowable over Ye in view of Alvarez et al. and an allowance at an early date would be greatly appreciated.

Claims 20-23:

Claims 20-23 were rejected as obvious over U.S. Patent No. 6,374,227 to Ye in view of U.S. Patent Publication No. 2002/0184555 by Wong et al., which is respectfully traversed.

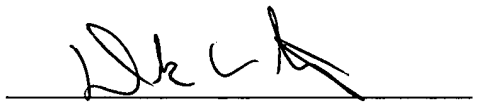
In the interest of brevity, the Office Action assertions regarding claims 20-23 are not being individually addressed here. Rather, Applicant asserts that claims 20-23 are dependent upon independent claim 2. Dependent claims include all of the limitation of the claim upon which they depend. The Office Action rejection of claims 20-23 refers to Ye as teaching the limitations of claim 2, which is incorrect. As explained above, Ye does not teach many of the limitations of claim 2. Therefore, Ye does not teach many of the limitations of each of claims 20-23. Assuming for the sake of argument that there was a motivation or suggestion to combine Ye and Alvarez et al., such a combination would not teach or suggest these differences. Accordingly, claims 20-23 are allowable over Ye in view of Alvarez et al. and an allowance at an early date would be greatly appreciated.

Conclusion:

In view of the above, the Applicant submits that all of the pending claims are now allowable. Allowance at an early date would be greatly appreciated. Should any outstanding issues remain, the Examiner is encouraged to contact the undersigned at (408) 293-9000 so that any such issues can be expeditiously resolved.

Respectfully Submitted,

Dated: August 29, 2006



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